MIDDLE ATLANTIC
Region 1
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Spearheading the Transition to iPads in the Medical
School Curriculum at the University of Rochester
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University of Rochester Medical Center
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Executive Summary

During the award period, the staff of the Edward G. Miner Library, already the primary support group for University of Rochester medical student information and computing needs, became the School's experts in the use of iPads in the curriculum. Fifteen iPads, with associated software and accessories, were purchased for the librarians, technology support staff, and e-Learning staff of the Library. Through completion of 10 hours of hands-on training and much individual practice, Miner librarians and staff gained the knowledge and skills necessary to support medical students in their use of these mobile devices for an initial pilot in one course of the medical school curriculum during the spring semester of 2012.

Library staff partnered with the Office of the Senior Associate Dean for Medical Education, as well as the Academic Technology group, to prepare for the rollout of iPads to all first-year medical students. The computing section of the Library web site now includes iPad support information, including app reviews(www.urmc.edu/miner/about/Computing/index.cfm). Library technology staff worked out a way for students to share learning materials within their Problem-Based-Learning groups, and they also converted one existing education module to an iPad-friendly app format. And finally, on March 7, librarians and technology/e-learning staff paired up as instructors to hand out iPads to the students and provide training in small groups.

Medical students now consider the librarians and library staff to be iPad experts and come to them with problems and suggestions. Faculty members know that library staff were major players in this initiative, and they now consult with Miner staff to explore use of iPad-friendly learning materials. In addition, a brand new Instructional Design Specialist position has been approved and will be hired to provide support in developing interactive, multimedia content, to be delivered to mobile devices.

Minority Populations Served

African Americans: No
American Indians/Alaska Natives: No
Asian Americans: No
Hispanics/Latinos: No
Native Hawaiians and Pacific Islanders: No
Other: No

Approaches and Interventions Used

The objectives for this project follow, with specific activities leading to successful iPad implementation listed for each:

1.	Library staff will gain sufficient knowledge and skills to feel competent in supporting first and second-year medical students and instructors in the initial year of the medical school's transition to using iPads in the curriculum. The timeline will commence with the 2012 academic year during a 2012 spring pilot.
•	20 iPads (15 with award funds and 5 with Library funds), along with associated software and accessories, were purchased for selected Library staff.
•	During January and February five 2-hour iPad training sessions were held for staff, with staff split into two groups for each session. Topics covered were: : Hardware and Basics; Syncing with iTunes and iCloud; Installing Apps; Wireless and Email; Security; Location Services; Messaging; VPN; AirPlay Mirroring; Blackboard Mobile Learn; Textbook Apps; Installing Profiles; and Reading and Annotating PDFs.
•	E-Learning staff worked with the instructors of the iPad implementation pilot course to be sure all learning materials in Blackboard adhered to best practices.
•	IT staff developed a URMC "PBL Cloud" server that medical students in Problem-Based Learning (PBL) groups could use to share materials with their PBL group peers.
•	Technology staff worked with the Medical Center's Information Systems Division to set up separate networks for using Apple TV and AirPlay in designated areas, for the purpose of mirroring and projecting an instructor's iPad screen. Not every instruction room was able to be outfitted in this way. For those that could not, a VGA adaptor was used.
•	A "Miner.iPad" course was set up in Blackboard, the online learning system, where staff could go to practice downloading course materials. The "SMDStudent.iPad" course was established in Blackboard for use during the medical student iPad training sessions. Two documents of particular note are included in the course, for easy access by students – "Textbook Apps," and "Recommended Medical Apps."
•	An outline for the March 7 sessions for medical students (as well as the training for staff) was developed by a core team consisting of the Library's Director, two Assistant Directors, Manager of Information Systems, and Manager of e-Learning.
•	On March 7, 2012, librarians and technology/e-learning staff paired up as instructors to hand out iPads to the students and provide training (in ten, simultaneous 1.5-hour small-group sessions).
•	Two internal PR pieces highlighted the March 7 iPad event:
o www.urmctoday.com/index.php?option=com_content&view=article& id=2156:fully-wired-med-students-receive-ipads-this-week&catid=38:top-stories&Itemid=62
o minernews.wordpress.com/2012/03/06/ipads-smd/

2.	E-Learning staff, supported by information technology staff, will develop a plan to convert an existing locally-created interactive learning module into iOS (iPad) enabled interactive content. At least one conversion of an existing learning module used in a medical school course will be presented to the Senior Associate Dean for Medical Education and to course instructors. Further investigation into the conversion of older computer-assisted-instruction content will be done.
•	E-Learning staff developed learning modules, converting from static PowerPoint files into video/audio files. These modules can be used in place of classroom lectures. The plan included assessing the content, meeting with the instructors to discuss the possible options, and deciding on appropriate tools to create mobile-accessible content. The instructors/assistants wrote scripts and did voiceover recording. The instructional designer then completed the final production of the video file.
o	Example: Electrophoresis Basics Narrated Presentation (MP4 Video) (9:41) ? Development Tools: Camtasia 6.0 Software, Microphone
o	Another Example: Fatty Acid Structure Whiteboard Illustration (MP4 Video) (1:52]
?	Development Tools: Video Camera, Windows Movie Maker 2.6 Software, Format

Factory 2.7 Software

• E-Learning staff also assisted in the standardization of syllabus content for one pilot course. The standard for the course was determined to be PDF. Staff worked with the course coordinator and developed guidelines for content conversion that would keep the content under a certain size to enable speedy accessibility and incorporate bookmarks for enhancing navigability. Future course conversions will maintain this minimum PDF standard, but will move beyond the static PDFs to include interactive, rich-media content.

• Library technology staff converted one existing educational module ("Histo Slide") to an iPad app.

o This required us to take advantage of the University's iOS development license, as well as a significant amount of independent learning on the part of the Library programmer.

o The development work has been completed, though the distribution mechanism is still being worked out due to difficulties with the University's iOS development license.

o The app has been presented to the course instructor who will use this app, and we have an appointment with the Senior Associate Dean for Medical Education.

• We are now meeting with additional instructors who will determine which other existing educational modules will be converted.

3. A student portal, "iURMCApps," will be created, offering a collection of Library staff-reviewed apps for use by medical students and faculty. An avenue to elicit feedback from current medical students on their opinions and favorite applications will also be created within the portal.

• A web page with iPad support information was created -- www.urmc.edu/miner/about/Computing/ipad/

• Staff members each evaluated 2-3 iPad apps and the reviews have been posted to a newly-created app review site – iURMCapps (www.urmc.edu/miner/about/Computing/ipad/iurmcapps/)

• Students can add their own reviews or request that a particular app be reviewed by library staff.

Evaluation Activities

Prior to iPads being distributed to Library staff, each staff member who was to receive an iPad completed an online assessment. Data regarding skill level and level of comfort with iPads was collected. First, staff members were asked to express their familiarity with the iPad using a Likert scale. 40% said they either Strongly Agreed or Agreed with the statement, "I am very familiar with the iPad." However, of 100 possible points, staff averaged only 58.2 points on the questions that measured their knowledge and skills. After taking the assessment, several staff admitted to initially believing they knew more about the iPad than they did. This notion is supported by comparing initial "familiarity" responses to individual assessment scores.

That same assessment instrument was just re-taken as a post-project assessment. Now, we find that 93% feel they are very familiar with the iPad, and the overall score on the knowledge questions was 85.95, up from 58.2 in the pre-assessment.

During sessions 2 and 3 of the Library staff training, competencies were reviewed and assessed via a performance checklist; each staff member pulled from a hat a previously-covered topic and he/she demonstrated that item to the others in the class. During session 4 each instructor randomly selected one of the topics that would be covered in the training sessions with medical students, and that person had to teach that topic to the rest of the library staff members in their session.

Medical students have just signed up to attend a "dialog session" on Thursday, April 26, where the following questions will be used to assess the success of the project and to get suggestions for things that could be improved:

1.   How has the iPad changed your workflow in the PBL/LAB/lectures?
2.   How has the iPad influenced the way you interact with course material?
3.   How would you like to use your iPad in PBL/Lab/Lectures?
4.   What were your expectations of the iPads in the curriculum?

More than 30 of the 100 first-year medical students volunteered to attend this session – many more than normally volunteer for other evaluation sessions held by the School of Medicine & Dentistry (SMD). We will have to schedule more sessions so that we can keep the groups small and interactive.

Problems or Barriers Encountered

Librarians, technology staff, and e-learning staff thought they knew more about iPads than they really did. The pre-assessment results showed us that there was much to learn, even though many thought they were quite familiar with the iPad. Even the few of us who already had iPads, or even iPhones, did not have the full understanding that would make us "experts" in the eyes of the students and faculty. We had to perform in-depth research and do lots of preparation, and then teach the rest of the staff, holding everyone to the same high standards of performance. A few of the librarians had a particularly tough time; it took them quite awhile to feel comfortable with the iPads, and they did not enjoy the process and the training as much as the others.

We did have some challenges using AirPlay and Apple TV devices for projecting iPad screens for instruction purposes. We have found that iPads (and the AirPlay technology) are predominately designed for the consumer and that Apple's focus on the enterprise environment is secondary. We are still working on this and do not yet have all the PBL rooms equipped with Apple TV using AirPlay. We have recently received a quote for $15,000 to re-engineer the network and buy the access points and Apple TV devices that will make this work.

We thought that iAnnotate would be the document reader/annotator of choice. However, this app proved to be difficult to set up for transferring documents between iPads and the PBL Cloud server that we developed for sharing PBL materials. We had to move to GoodReader, which is adequate but not intuitive. We also are still having some troubles with the PBL Cloud server and are considering other options (Box.net). Dropbox may have been an option, but aside from collaboration issues, the Medical Center is concerned about the security of data on Dropbox, and we deemed it unacceptable to rely on that document sharing system.

Our investigation into the conversion of older, pre-existing computer-assisted-instruction content went very well, to the extent that we were able to convert one of our modules into an iPad app. However, due to our institution's difficulty with its Apple Enterprise iOS developer license, we are unable to distribute the app. We are currently working to resolve this issue.

Continuation Plans

The School of Medicine & Dentistry will continue to give iPads to the incoming medical student classes. In August 2012 the Class of 2017 will receive iPads during orientation week, with Library staff serving as iPad experts and instructors. We plan to have a new PBL Cloud server by that time, and also have all PBL rooms equipped with Apple TVs. In addition, the iPads will be used instead of laptops for the six sessions that librarians teach as part of the first medical school course, Mastering Medical Information.

Library staff will continue to share new apps with each other and will become more adept at using Keynote on the iPads. They already bring the iPads to meetings and use them for taking notes. As well, they go with the librarians as they are "on the go" in the Medical Center – providing access to resources, productivity tools, and communication tools in one portable device. iPads will support the librarians' liaison work with the faculty, staff, and students in all departments of the Medical Center. In addition, the iPads will support the Personal Librarian program that was established in 2010. Each incoming medical student is assigned a librarian, and it is the goal of the program to build and continue a relationship between the students and the librarians. The iMessage and Facetime functions of the iPad already are allowing texting and video calling between iPads, opening another avenue of communication between librarians and their students.

Impact

We are very grateful to have received this award to purchase iPads for the Library staff. It was absolutely critical to the Library's success, helping us to become the iPad experts that could lead the School in this important educational initiative. Our status in the eyes of the School of Medicine & Dentistry deans and faculty was enhanced. We are considered a group that collaborates, that makes things happen in a short time frame, and that has the knowledge and the expertise to develop solutions to challenging problems. We were at the forefront of this breakthrough initiative, and we intend to remain so.

The other major outcome was the approval of a new position within the e-Learning group of Miner Library. Because of our existing role as supporters of Medical Center e-Learning, but also because of our new-found recognition as mobile device experts, we have been given the green light to recruit for an Instructional Design Specialist. This individual will provide pedagogical support to augment traditional face-to-face courses in the School of Medicine & Dentistry's (SMD) curriculum with interactive, multimedia content, delivered in a digital, mobile-ready environment. The person in this position will partner with faculty and medical school administration in the design of online coursework/programs and instructional practices, development of learning resources, and re-visioning of courses and course segments to mobile, electronic delivery methods.

We plan to analyze the transcripts of our dialog sessions with students and to develop a presentation, paper, and/or poster that describe this project and input from students. We are looking forward to making the changes that the students suggest and showing that the use of iPads positively affects curricular outcomes.

Another outcome of having iPads is that they now allow the Miner librarians to have functional, on-the-go access to resources, productivity tools, and communication tools in one portable, lightweight device. This supports the librarians' liaison work with the faculty, staff, and students in all departments of the Medical Center. One of the librarian liaisons and I recently met with a Center Director; during the meeting we were able to look at his lab website on our iPads and have a conversation about the data repository that he has developed. Having that immediate access facilitated our discussion about the possible role of his liaison librarian in data management. Finally, the librarians provide information to patients and their families via the Information Prescription program, and iPads will give the librarians mobility and flexibility and the ability to have with them a world of information when they meet with these patients and families in the hospital rooms and the Neonatal Intensive Care Unit.

Lessons Learned

Since the 1990s the Library has been the key provider of technology support for medical students at the University of Rochester. We also administer Blackboard, the online learning management system for the Medical Center. Because of this it was natural for us to extend our role and support the mobile delivery of learning materials. Many academic health sciences libraries are not in such a good position to become the iPad "experts" in their medical school, so we are very fortunate here, in many ways. But perhaps more important is the fact that students consider us to be very responsive to their needs, providing outstanding customer service. The Office of the Senior Associate Dean for Medical Education listens carefully to students and agrees that we are the "right" group to provide this support. The Library's role in student technology support and online learning is critical as we work to develop new roles for librarians within our institution, and we encourage other libraries to become more involved, when possible, in these areas.

It seems that librarians, technology staff, and e-learning staff thought they knew more about iPads than they really did. The pre-assessment results showed us that there was much to learn, despite many staff members considering themselves to be quite familiar with the iPad. Even the few of us who already had iPads, or even iPhones, did not have the full understanding that would make us "experts" in the eyes of the students and faculty. We had to perform in-depth research and do lots of preparation, and then teach the rest of the staff, holding everyone to the same high standards of performance. A few of the staff members had a particularly tough time; it took them quite awhile to feel comfortable with the iPads, and they did not enjoy the process and the training as much as others. In the end, though, they can consider themselves to be the "experts" we were striving for.

We did learn that iPads are very personal devices. It was critical that each librarian, technology and e-learning staff member had his/her own iPad. When a librarian or staff member can have the iPad with them both at work and at home, he/she can feel free to experiment, to practice outside of work time, to utilize the device to its fullest. The Problem-Based-Learning tutors in the School of Medicine & Dentistry were not so fortunate; SMD did not have the funds to buy an iPad for each tutor, so the use of iPads in the PBL environment has suffered.

Other

www.urmctoday.com/index.php?option=com_content&view=article&id=2156:fully-wired-med-students-receive-ipads-this-week&catid=38:top-stories&Itemid=62

minernews.wordpress.com/2012/03/06/ipads-smd/

Attachment 1: AR summary data: Subcontractor activities